

**AMENDMENTS TO THE CLAIMS**

1-47. (Cancelled)

48. (Previously Presented) A method of conferring resistance to protoporphyrinogen oxidase-inhibiting herbicides upon plants or plant cells, comprising introducing a DNA fragment or a plasmid containing the DNA fragment into plants or plant cells or algal cells, wherein said DNA fragment has the following characteristics:

(1) said DNA fragment is 2.6 to 13.8 kb in length;

(2) said DNA fragment has a sequence that can be detected and isolated by DNA-DNA or DNA-RNA hybridization to a nucleic acid sequence that is complementary to a nucleotide sequence encoding the amino acid sequence of SEQ ID NO:1, wherein said DNA-DNA or DNA-RNA hybridization occurs under 2X PIPES buffer, 50% deionized formamide, 0.5% (w/v) SDS, 500µg/ml denatured sonicated salmon sperm DNA at 42°C overnight; and said DNA fragment remains hybridized after washing in 0.2X SSC, 0.1% (w/v) SDS at 68°C;

(3) said DNA fragment encodes an amino acid sequence in which an amino acid at a position corresponding to position 13 of SEQ ID NO:1 is an amino acid other than valine; and

(4) said DNA fragment has an ability to confer resistance to protoporphyrinogen oxidase-inhibiting herbicides in plant or algal cells when introduced therein.

49. (Previously Presented) The method according to claim 48, wherein the nucleic acid sequence encoding the amino acid sequence of SEQ ID NO:1 is the nucleotide sequence of SEQ ID NO:4.

50. (Previously Presented) The method according to claim 48, wherein the plant is a dicot.

51. (Previously Presented) The method according to claim 48, wherein the plant is a monocot.

52. (Currently Amended) ~~The method according to claim 48~~ A method of conferring resistance to protoporphyrinogen oxidase-inhibiting herbicides upon the green algae *Chlamydomonas* or cells thereof, comprising introducing a DNA fragment or a plasmid containing the DNA fragment into the algal cells or algal cells, wherein said DNA fragment has the following characteristics:

(1) said DNA fragment is 2.6 to 13.8 kb in length;

(2) said DNA fragment has a sequence that can be detected and isolated by DNA-DNA or DNA-RNA hybridization to a nucleic acid sequence that is complementary to a nucleotide sequence encoding the amino acid sequence of SEQ ID NO:1, wherein said DNA-DNA or DNA-RNA hybridization occurs under 2X PIPES buffer, 50% deionized formamide, 0.5% (w/v) SDS, 500 µg/ml denatured sonicated salmon sperm DNA at 42°C overnight; and said DNA fragment remains hybridized after washing in 0.2X SSC, 0.1% (w/v) SDS at 68°C;

(3) said DNA fragment encodes an amino acid sequence in which an amino acid at a position corresponding to position 13 of SEQ ID NO:1 is an amino acid other than valine; and

(4) said DNA fragment has an ability to confer resistance to protoporphyrinogen oxidase-inhibiting herbicides in cells of ~~wherein the plant is~~ the green algae *Chlamydomonas* when introduced therein.

53. (Previously Presented) The method according to claim 48, wherein the amino acid at the position corresponding to position 13 of SEQ ID NO:1 is methionine.

54. (Previously Presented) The method according to claim 48, wherein said DNA fragment is 2.6 kb to 3.4 kb in length.

55. (Previously Presented) The method according to claim 48, wherein said DNA fragment is 2.6 kb to 10.0 kb in length.

56. (Previously Presented) The method according to claim 48, wherein said DNA fragment is obtained from a genomic DNA of a plant, or a plant cell or an algal cell.

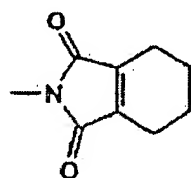
57. (Previously Presented) The method according to claim 48, wherein said DNA fragment is obtained from an algal cell.

58. (Previously Presented) A plant or plant cells or green alga upon which resistance is conferred by the method according to any one of claims 48 to 57.

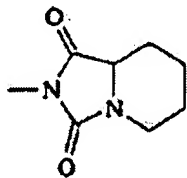
59. (Previously Presented) A method of selecting plant or algal cells upon which resistance to protoporphyrinogen oxidase-inhibiting herbicides is conferred, which comprises:  
treating a population of plant or algal cells, upon which resistance to protoporphyrinogen oxidase-inhibiting herbicides is conferred by the method according to any one of claims 48 to 57, with a protoporphyrinogen oxidase-inhibiting herbicide in an amount which normally blocks growth of said plant or algal cells expressing only herbicide-sensitive protoporphyrinogen oxidase.

60. (Previously Presented) A method of controlling plants lacking resistance to protoporphyrinogen oxidase-inhibiting herbicides in cultivating fields of crop plants upon which resistance to protoporphyrinogen oxidase-inhibiting herbicides is conferred by the method as described in any one of claims 48 to 57, which comprises:  
applying to said field at least one protoporphyrinogen oxidase-inhibiting herbicide in effective amounts to inhibit growth of said plants lacking resistance to protoporphyrinogen oxidase-inhibiting herbicides.

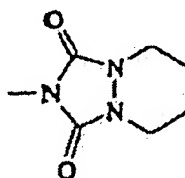
61. (Previously Presented) The method according to claim 60, wherein the protoporphyrinogen oxidase-inhibiting herbicides to be applied are selected from the group of compounds of the formula X-Q, wherein Q is selected from the group consisting of:



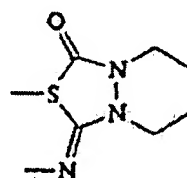
( Formula 1 )



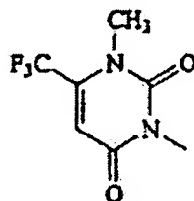
( Formula 2 )



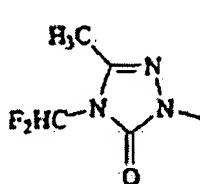
( Formula 3 )



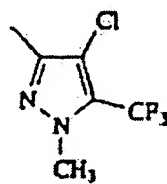
( Formula 4 )



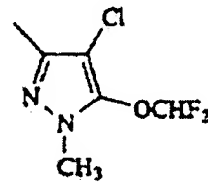
( Formula 5 )



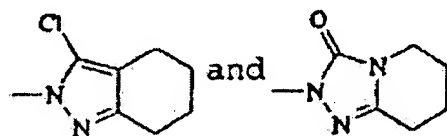
( Formula 6 )



( Formula 7 )



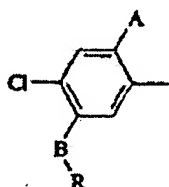
( Formula 8 )



( Formula 9 )

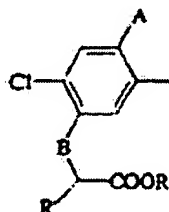
( Formula 10 )

and X is selected from the group consisting of:



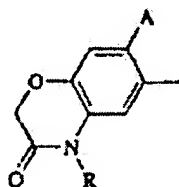
( Formula 11 )

wherein  
 A = H, halogen  
 B = O, S  
 R = C<sub>1</sub>-C<sub>8</sub> alkyl,  
 C<sub>2</sub>-C<sub>8</sub> alkenyl,  
 C<sub>3</sub>-C<sub>8</sub> alkynyl



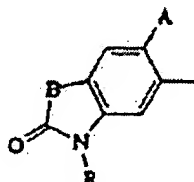
( Formula 12 )

wherein  
 A = H, halogen  
 B = O, S  
 R' = H, CH<sub>3</sub>  
 R = C<sub>1</sub>-C<sub>8</sub> alkyl,  
 C<sub>2</sub>-C<sub>8</sub> alkenyl,  
 C<sub>3</sub>-C<sub>8</sub> alkynyl



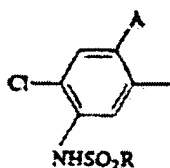
( Formula 13 )

wherein  
 A = H, halogen  
 R = C<sub>1</sub>-C<sub>8</sub> alkyl,  
 C<sub>2</sub>-C<sub>8</sub> alkenyl,  
 C<sub>3</sub>-C<sub>8</sub> alkynyl



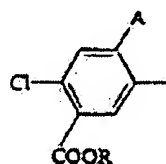
( Formula 14 )

wherein  
 A = H, halogen  
 B = O, S  
 R = C<sub>1</sub>-C<sub>8</sub> alkyl,  
 C<sub>2</sub>-C<sub>8</sub> alkenyl,  
 C<sub>3</sub>-C<sub>8</sub> alkynyl



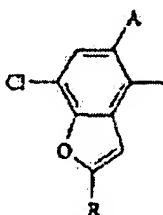
( Formula 15 )

wherein  
 A = H, halogen  
 R = C<sub>1</sub>-C<sub>8</sub> alkyl,  
 C<sub>2</sub>-C<sub>8</sub> alkenyl,  
 C<sub>3</sub>-C<sub>8</sub> alkynyl



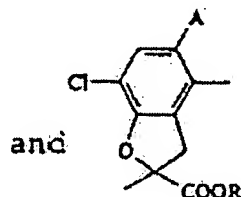
( Formula 16 )

wherein  
 A = H, halogen  
 R = C<sub>1</sub>-C<sub>8</sub> alkyl,  
 C<sub>2</sub>-C<sub>8</sub> alkenyl,  
 C<sub>3</sub>-C<sub>8</sub> alkynyl



( Formula 17 )

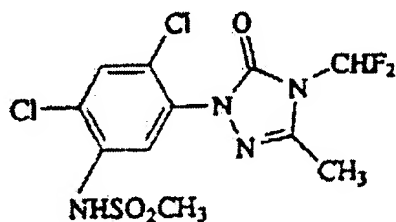
wherein  
 A = H, halogen  
 R = C<sub>1</sub>-C<sub>8</sub> alkyl,  
 C<sub>2</sub>-C<sub>8</sub> alkenyl,  
 C<sub>3</sub>-C<sub>8</sub> alkynyl



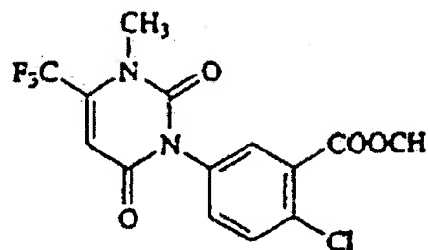
( Formula 18 )

wherein  
 A = H, halogen  
 R = C<sub>1</sub>-C<sub>8</sub> alkyl,  
 C<sub>2</sub>-C<sub>8</sub> alkenyl,  
 C<sub>3</sub>-C<sub>8</sub> alkynyl

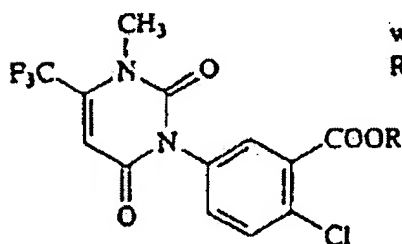
62. (Previously Presented) The method according to claim 60, wherein the protoporphyrinogen oxidase-inhibiting herbicides to be applied is selected from the group consisting of the compounds of the formula:



( Formula 19 )

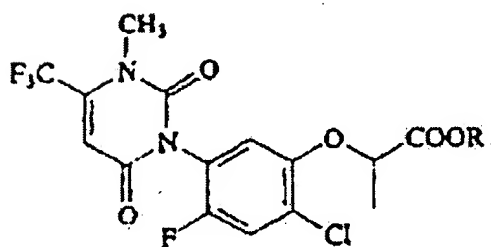


( Formula 20 )



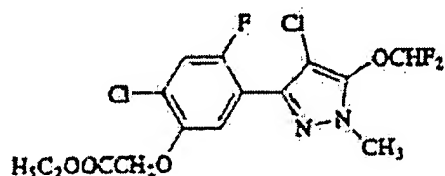
( Formula 21 )

wherein  
 R = (C<sub>2</sub>-C<sub>3</sub> alkenyloxy) C<sub>1</sub>-C<sub>4</sub> alkyl



( Formula 22 )

wherein  
 R = C<sub>1</sub>-C<sub>8</sub> alkyl,  
 C<sub>3</sub>-C<sub>8</sub> alkenyl,  
 C<sub>3</sub>-C<sub>8</sub> alkynyl



( Formula 23 )

lactofen,

[N-(4-chloro-2-fluoro-5-propargyloxy)phenyl-3,4,5,6-tetrahydrophthalimide,

pentyl [2-chloro-5-(cyclohex-1-ene-1,2-dicarboximido)-4-fluorophenoxy] acetate,

7-fluoro-6-[(3,4,5,6-tetrahydro)phthalimido]-4-(2-propynyl)-1,4-benzoxazin-3(2H)-one,

6-[(3,4,5,6-tetrahydro)phthalimido]-4-(2-propynyl)-1,4-benzoxazin-3(2H)-one,

2-[7-fluoro-3-oxo-4-(2-propynyl)-3,4-dihydro-2H-1,4-benzoxazin-6-yl]perhydroimidazo[1,5-a]pyridine-1,3-dione,

2-[(4-chloro-2-fluoro-5-propargyloxy)phenyl] perhydro-1H-1,2,4-triazolo-[1,2-a]pyridazine-1,3-dione,

2-[7-fluoro-3-oxo-4-(2-propynyl)-3,4-dihydro-2H-1,4-benzoxazin-6-yl]5,6,7,8-1,2,4-triazolo[4,3-a]pyridine-3H-one,



63. (Previously Presented) An isolated DNA fragment which has the following characteristics:

- (1) said DNA fragment is 2.6 to 13.8 kb in length;
- (2) said DNA fragment has a sequence that can be detected and isolated by DNA-DNA or DNA-RNA hybridization to a nucleic acid sequence that is complementary to a nucleotide sequence encoding the amino acid sequence of SEQ ID NO:1, wherein said DNA-DNA or DNA-RNA hybridization occurs under 2X PIPES buffer, 50% deionized formamide, 0.5% (w/v) SDS, 500 µg/ml denatured sonicated salmon sperm DNA at 42 °C overnight; and said DNA fragment remains hybridized after washing in 0.2X SSC, 0.1% (w/v) SDS at 68 °C;
- (3) said DNA fragment encodes an amino acid sequence in which an amino acid at a position corresponding to position 13 of SEQ ID NO:1 is an amino acid other than valine; and
- (4) said DNA fragment has an ability to confer resistance to protoporphyrinogen oxidase-inhibiting herbicides in plant or algal cells when introduced therein.

64. (Previously Presented) The isolated DNA fragment according to claim 63, wherein the plant is a dicot.

65. (Previously Presented) The isolated DNA fragment according to claim 63, wherein the plant is a monocot.

66. (Currently Amended) ~~The isolated DNA fragment according to claim 63~~ An isolated DNA fragment which has the following characteristics:

- (1) said DNA fragment is 2.6 to 13.8 kb in length;
- (2) said DNA fragment has a sequence that can be detected and isolated by DNA-DNA or DNA-RNA hybridization to a nucleic acid sequence that is complementary to a nucleotide sequence encoding the amino acid sequence of SEQ ID NO:1, wherein said DNA-DNA or DNA-RNA hybridization occurs under 2X PIPES buffer, 50% deionized formamide, 0.5% (w/v) SDS, 500 µg/ml denatured sonicated salmon sperm DNA at 42 °C overnight; and said DNA fragment remains hybridized after washing in 0.2X SSC, 0.1% (w/v) SDS at 68 °C;
- (3) said DNA fragment encodes an amino acid sequence in which an amino acid at a position corresponding to position 13 of SEQ ID NO:1 is an amino acid other than valine; and
- (4) said DNA fragment has an ability to confer resistance to protoporphyrinogen oxidase-inhibiting herbicides in cells of , wherein the plant is the green alga *Chlamydomonas* when introduced therein.

67. (Previously Presented) The isolated DNA fragment according to claim 63, wherein said amino acid other than valine is methionine.

68-69. (Cancelled)

70. (Previously Presented) The isolated DNA fragment according to claim 63, wherein said DNA fragment is 2.6 kb in length.

71. (Previously Presented) A plasmid comprising the DNA fragment according to claim 63.

72. (New) The method according to claim 52, wherein the nucleic acid sequence encoding the amino acid sequence of SEQ ID NO:1 is the nucleotide sequence of SEQ ID NO:4.

73. (New) The method according to claim 52, wherein the amino acid at the position corresponding to position 13 of SEQ ID NO:1 is methionine.

74. (New) The method according to claim 52, wherein said DNA fragment is 2.6 kb to 3.4 kb in length.

75. (New) The method according to claim 52, wherein said DNA fragment is 2.6 kb to 10.0 kb in length.

76. (New) The method according to claim 52, wherein said DNA fragment is obtained from an algal cell.

77. (New) A green alga *Chlamydomonas* upon which resistance is conferred by the method according to claim 52.

78. (New) The isolated DNA fragment according to claim 66, wherein said amino acid other than valine is methionine.

79. (New) The isolated DNA fragment according to claim 66, wherein the nucleotide sequence encoding the amino acid sequence of SEQ ID NO:1 is the nucleotide sequence of SEQ ID NO: 4.

80. (New) The isolated DNA fragment according to claim 79, wherein a nucleotide corresponding to position 37 (G37) of SEQ ID NO: 4 is a nucleotide other than guanine in the sequence of the DNA fragment.

81. (New) The isolated DNA fragment according to claim 80, wherein said nucleotide other than guanine is adenine.

82. (New) The isolated DNA fragment according to claim 66, wherein said DNA fragment is 2.6 kb in length.

83. (New) A plasmid comprising the DNA fragment according to claim 66.